FINAL REPORT

Marine Endangered Species Monitoring Program
US Army Corps of Engineers
Galveston District

Maintenance Dredging
Brazos Santiago Pass

Dates: 13 December- 19 December 2002

Submitted by:

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ABSTRACT

A twenty-four hour per day marine endangered species monitoring program was conducted onboard the hopper dredge *B.E. Lindholm* during the Brazos Santiago Pass maintenance dredging project from 13 December through 19 December 2002. Endangered and threatened sea turtles *Caretta caretta* (loggerhead), *Chelonia mydas* (green), *Lepidochelys kempi* (Kemp's ridley), *Dermochelys coriacea* (leatherback) and *Eretmochelys imbricata* (hawksbill) were the species targeted. A total of 3 incidents were recorded in which all/or parts of these species were found. The take limit of 2 green turtles was compromised on 19 December, which resulted in consultation with National Marine Fisheries Service and the U.S. Army Cops of Engineers. As a result, dredging activities were terminated on 19 December 2002.

INTRODUCTION

The REMSA Inc. Marine Endangered Species Observer Division was subcontracted by U.S. Army Corps of Engineers (ACOE) in the Galveston District to monitor the impact of dredging on endangered sea turtle species in the area of dredge operations. Pursuant to agreements with the National Marine Fisheries Service (NMFS), two certified observers were required onboard during the months of prime sea turtle activity for that area to document any detected incidents involving target species.

SCOPE OF WORK

REMSA was to provide the necessary trained personnel and equipment to clean and monitor inflow screens onboard the hopper dredge *B.E. Lindholm* and to provide the necessary reports. Monitoring was performed 24 hours each day from 13 December 2002 through 19 December 2002. Observers were to inspect and clean all inflow and overflow screens, and to inspect both dragheads each time they were brought on deck for cleaning and maintenance. Any death or injury involving target species, the Loggerhead turtle (*Caretta caretta*), Green turtle (*Chelonia mydas*), Kemp's Ridley turtle (*Lepidochelys kempi*), Leatherback turtle (*Dermochelys coriacea*), and Hawksbill turtle (*Eretmochelys imbricata*) was to be identified, logged, measured, and photographed. Disposal of any animals recovered was to be the responsibility of the observer and dredge personnel. A load sheet was to be completed for each load whether or not turtle parts were found. In the case of an incident involving a sea turtle, an incident report form was to be completed and the observers were to contact NMFS within twenty-four hours of the incident. These forms were to be provided by the dredging contractor. A daylight bridge watch was to be conducted during periods when the observer was not occupied with screen cleaning duties. Observers were to be certain that dredge crew personnel were aware of the need to avoid incidents involving any endangered animal, and that civil and criminal penalties are possible for harming or harassing endangered species.

METHODS

Dredging by the hopper dredge *B.E. Lindholm* began when the observers arrived onboard on 13 December 2002 to 19 December 2002 in Brazos Santiago Pass (Loads 001-060).

Two certified observers were present onboard the dredge during all dredging operations working 12 hour shifts.

The Dredge *B.E. Lindholm* functioned with 100% inflow screening with sea turtle draghead deflectors being used. The screening baskets were fitted with 4" x 4" screening material to insure that parts of targeted species would not be allowed to flow through into the hopper. All dragheads and screening baskets were checked after each load of the observers 12-hour shift. The appropriate forms were to be filled out, noting any incidents regarding targeted species as well as the marine life present in the inflow and overflow boxes.

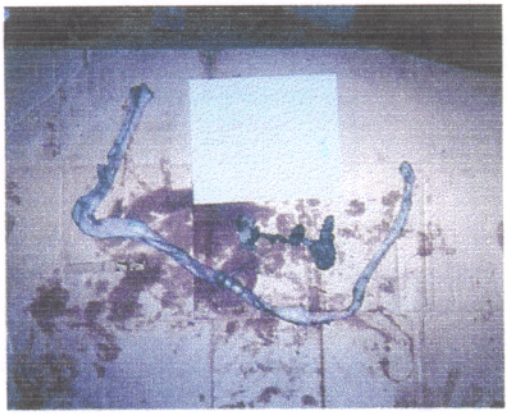
A bridge lookout was maintained during those daylight hours that the observer was not on deck checking screens. Watch was kept for turtles in the dredging area and dump site.

RESULTS

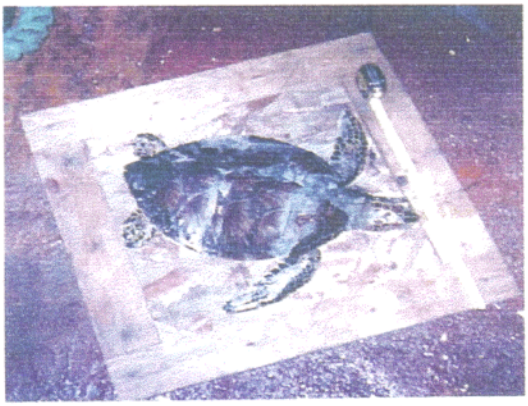
There were three reported incidents during the monitoring project at Brazos Santiago Pass near Brownsville, TX due to dredging activity. Incident 1 (load #26 on 15 December 2002) and incident 3 (load #59, on 19 December 2002) were both recovered in Brazos Santiago Pass both specimens were identified as greens (*Chelonia mydas*). It was found that incident 2 (load #29 on 16 December 2002) was part of the same turtle from incident 1. It showed that the same viscera found in load 29 were missing from the same green (*Chelonia mydas*) in load 26. All incidents were reported to be fresh. Proper incident reports were completed and faxed to NMFS (Appendix 1).

Incident #1
Specimen 1
Brazos Santiago Pass
15 December 2002, Load #26
Chelonia mydas

Incident #2
Viscera from Specimen 1
Brazos Santiago Pass
16 December 2002, Load #29



Incident #3
Specimen 2
Brazos Santiago Pass
19 December 2002, Load #59
Chelonia mydas



DISCUSSION

On 13 December 2002, hopper dredge *B.E. Lindholm* began dredging in Brazos Santiago Pass near Brownsville, Texas. Dredging was conducted for a total of seven days with a total of 60 loads. On 15 December 2002, incident 1 was reported. The specimen was a whole juvenile green (*Chelonia mydas*) with a crushed carapace and neck. The second incident (load 29) was the missing viscera of incident 1(load 26). The observers were accurately able to match up the specimens and conclude that they were in fact from the same turtle.

On 18 December 2002, a meeting took place aboard the dredge *B.E. Lindholm* while it was temporarily shut down due to weather. The ACOE and two certified NMFS biologist discussed sea turtle behavior and migration patterns during the meeting to revise dredging and trawling activity for the area (written report Appendix 2).

On 19 December 2002, (load 59) the third turtle incident was reported. The specimen recovered was a juvenile green (*Chelonia mydas).* After NMFS received the information of the second take involving a green turtle, action was taken and dredging was terminated on 19 December 2002.

If there are any questions regarding this report please feel free to contact me at the number below.

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Appendix 1
Sea Turtle Incident Reports

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(1)

CLEAN 26

INCIDENT REPORT OF SEA TURTLE TAKE BY DREDGING ACTIVITY

Date 12/15/02 **Time (24 hr)** 2100

Species of Turtle Taken Green Turtle - Chelonia m. mydas

Dredging Site (channel, port, etc.) Brownsville TX Entrance Channel

Location of Take: Latitude 26° 03.982 N **Longitude** 97° 08.594 W

Vessel Name and Company RF Conductor Weeks Marine

Load # 26 **Times. Start** 1815 **End** 2030 **Dump** 2054

Sampling Method (overflow, inflow, etc.) INFLOW

Samples Recovered From Shoot Drainhead

Condition of Screening Good

Draghead Deflector? Yes ☒ **No** ☐

Condition of Deflector: Good

Weather Conditions: BSS 2 1-3ft swell

Water Temperature: Surface 62 **Column** 62 **°C or** (F) **(Circle one)**

Condition of specimen(s) sampled Whole, crushed carapace crushed neck wt~5-7lbs

Measurements (metric if possible):

Give estimate of entire carapace dimensions, as well as fragments samples:

Head With 2"

Plastron Length 12" **Width** 11"

Carapace *S.L. Length 13" **S.L. Width** ~ 11"

Carapace **O.C. Length unable to Det **O.C. Width** ~ 12"

Turtle Tagged? Yes ☐ **No** ☒ **Tag#** _____ **Date** / /

Comments: measurments marked a ~ due to crushed carapace specimen Bagged, tagged & Frozen ID'd Duncan Newberry conFirmed Gary Sundin

Observer's Name Duncan Newberry

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(2)

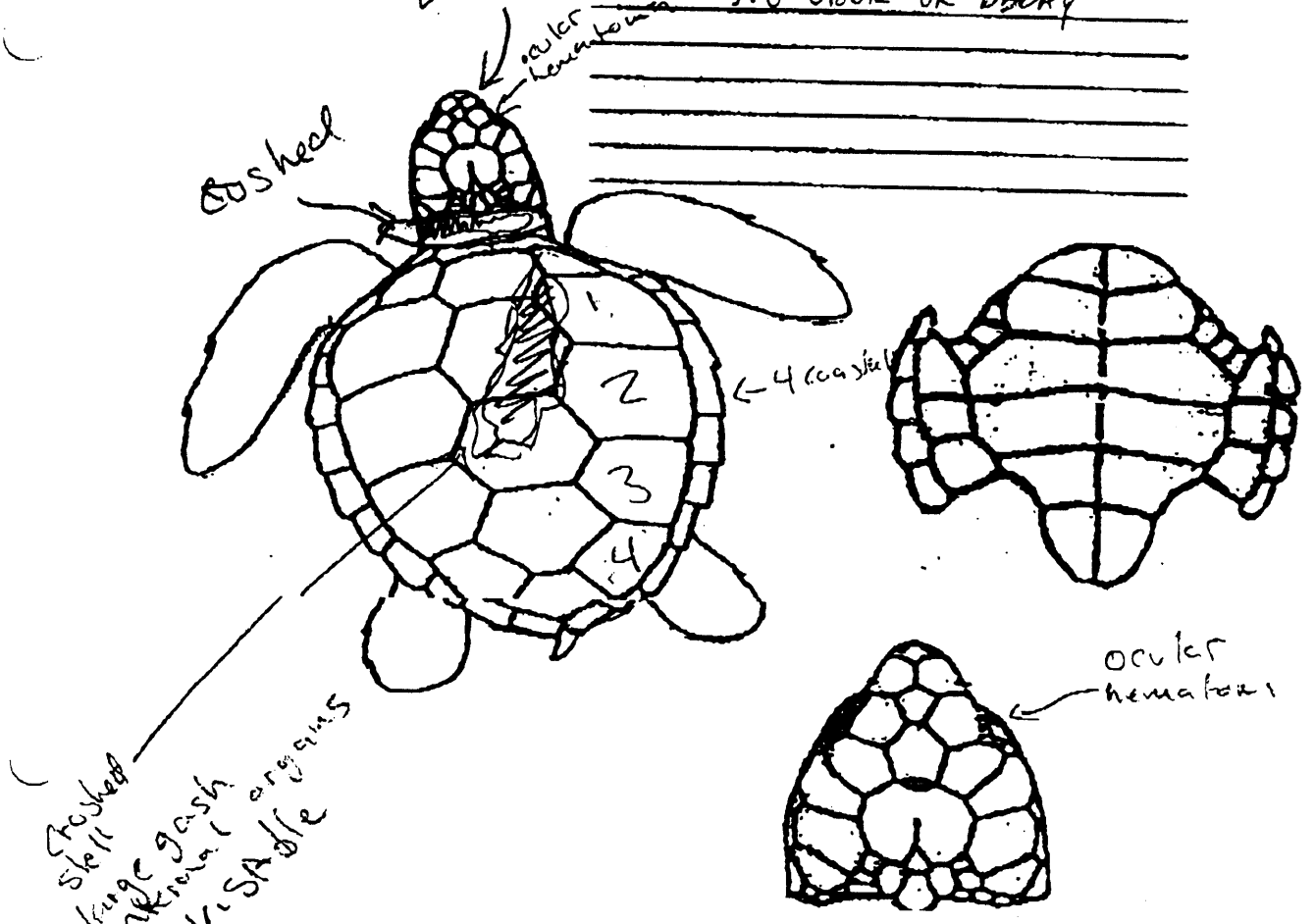
LOAD 26

73

Blacken/shade parts which are missing.
Sketch any visible cracks and lacerations.

Comments 4 coastals 2 interorbitals
D. Newberry

TISSUE FIRM AND PINK
NO ODOR OR DECAY



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(1)
LOAD 29

INCIDENT REPORT OF SEA TURTLE TAKE BY DREDGING ACTIVITY

Date 12/16/02 **Time (24 hr)** 0145

Species of Turtle Taken SPP. UNCERTAIN

Dredging Site (channel, port, etc.) BROWNSVILLE ENTRANCE CHANNEL / BROWNS CAMARGO PASS

Location of Take: Latitude 26°03.982' N **Longitude** 97° 08.558 W

Vessel Name and Company BE LINDHOLM WEEKS MARINE

Load # 29 **Times: Start** 0107 **End** 0202 **Dump** 0215

Sampling Method (overflow, inflow, etc.) INFLOW

Samples Recovered From STARBOARD DRAGHEAD

Condition of Screening GOOD

Draghead Deflector? Yes ☑ **No** ☐

Condition of Deflector: GOOD

Weather Conditions: 68°F; PARTLY CLOUDY; WIND SE @ 10 KTS; SEAS 3 FT

Water Temperature: Surface 17°C **Column** _____ **°C or °F (Circle one)**

Condition of specimen(s) sampled TISSUE FIRM, SANGUINOUS, NO DECAY NO ODOR - LENGTH OF INTESTINE & SMALL BONE FRAGMENT

Measurements (metric if possible): OVERALL LENGTH 107.5 CM

Give estimate of entire carapace dimensions, as well as fragments samples:

Head With —

Plastron Length — **Width** —

Carapace *S.L. Length — **S.L. Width** —

Carapace **O.C. Length — **O.C. Width** —

Turtle Tagged? Yes ☐ **No** ☑ **Tag#** _____ **Date** — / /

Comments: LENGTH OF INTESTINE & SMALL BONE FRAGMENT WITH SMALL AMOUNT [redacted] CONNECTIVE TISSUE. * FINDINGS SUGGEST STRONG POSSIBILITY THESE FRAGMENTS ARE FROM TURTLE PREVIOUSLY TAKEN IN LOAD # 26 * (SEE NEXT PAGE)

Observer's Name GARY SUNDIN

(2)

LOAD ?

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- PHOTOS TAKEN
- SPECIMENT SAVED / FROZEN
- NOTE - TAKE FROM LOAD #26 & #27 WERE FROM 73 SAME AREA (RED SIDE OF SHORT CHANNEL) SEVERAL HOURS APART. FRAGMENTS FROM THESE TAKES CAN BE COMBINED TO FORM SINGLE SPECIMEN

Sketch/shade parts which are missing.
Sketch any visible cracks and lacerations.

INTESTINAL PIECE

OVERALL LENGTH 107.5 cm

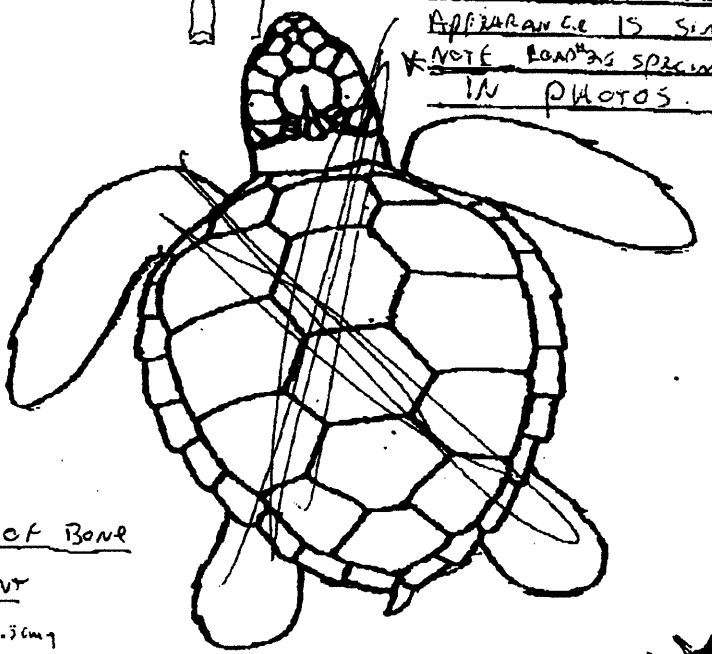
RANGE 5.5 to 9 cm IN CIRCUMFERENCE

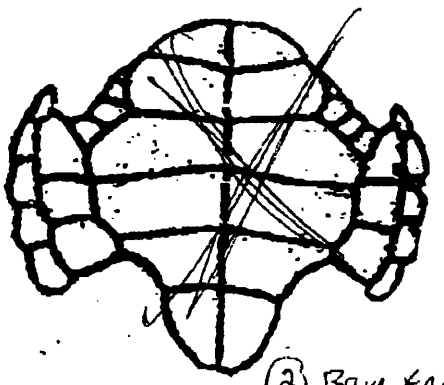
25cm

① LENGTH OF INTESTINE - OVERALL LENGTH (EXTENDED) OF 107.5 cm. 90° BEND WITH SHORT SEGMENT OF 25 cm. PINK & WHITE SANGUINOUS TISSUE. MUSCULAR AND IRREGULAR. SOME ATTACHED FAT. SMALL AMOUNTS OF BLACK FECAL MATERIAL & YELLOW BILIOUS MATERIAL INSIDE. CILIATED. RANGE 5.5 to 9 cm CIRCUMFERENCE.

* 5 mydas TAKE PREVIOUSLY IN LOAD #26 WAS RE-EXAMINED AND FOUND TO [redacted] HAVE AN EMPTY LOWER ABDOMINAL CAVITY. A SMALL LENGTH OF ESOPHAGUS/INTESTINE WAS NOTED EXTENDING FROM THROAT INTO BODY CAVITY. ANOTHER SMALL SEGMENT NOTED EXTENDING FROM ANUS. THE DIAMETER & APPEARANCE IS SIMILAR BETWEEN THE SEPARATE TAKES.

* NOTE LOAD #26 SPECIMEN LABELLED "A" AND LOAD #27 LABELLED "B" IN PHOTOS.





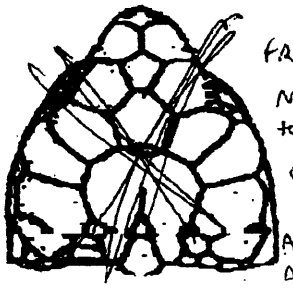
② BONE FRAGMENT

SMALL IRREGULAR BONE FRAGMENT ENTANGLED (BUT NOT ATTACHED VIA TISSUE) TO INTESTINE. UNKNOWN EXACT ORIGIN BUT POSSIBLY SCAPULA OR INNER PLASTRON. SMALL AMOUNT CONNECTIVE TISSUE ATTACHED W/ UNKNOWN TISSUE

DETAIL OF BONE FRAGMENT

2.3cm

5.5cm



↑ TRACHEA & SURROUNDING TISSUE W/ POSSIBLE ORGAN OR MESENTERY DEBRIS

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INCIDENT REPORT OF SEA TURTLE TAKE BY DREDGING ACTIVITY

Date 12/19/02 Time (24 hr) 1918

Species of Turtle Taken Green Turtle - Chelonia m mydas

Dredging Site (channel, port, etc.) Brownsville Entrance Channel

Location of Take: Latitude _____ Longitude Sta 6+000 - 12+000

Vessel Name and Company BE Lindholm

Load # 51 Times: Start 1100 End 1500 - 1811

Sampling Method (overflow, inflow, etc.) inFlow + overFlow

Samples Recovered From Stbd Drag head

Condition of Screening Good

Draghead Deflector? Yes ☒ No ☐ DSP

Condition of Deflector: no visable defects

Weather Conditions: BSS 3-4 4-5' seas 10-15 NNE wind

Water Temperature: Surface 64 Column 62. °C or °F (Circle one)

Condition of specimen(s) sampled torn up - found front 1/3 of torso Both Front Flippers + head

Measurements (metric if possible): _____

Give estimate of entire carapace dimensions, as well as fragments samples:

Head With ~ 12"

Plastron Length missing Width unable to det

Carapace *S.L. Length Partial S.L. Width _____

Carapace **O.C. Length Partial O.C. Width _____

Turtle Tagged? Yes ☐ No ☒ Tag# _____ Date 12/19/02

Comments: Pictures 10-6 on camera

Observer's Name Duncan Newberry w/ Cameron Coffee

W.M. & Thomas

Page 2 of 2
12/19/02 Load #59
Green turtle
Duncan Newberry

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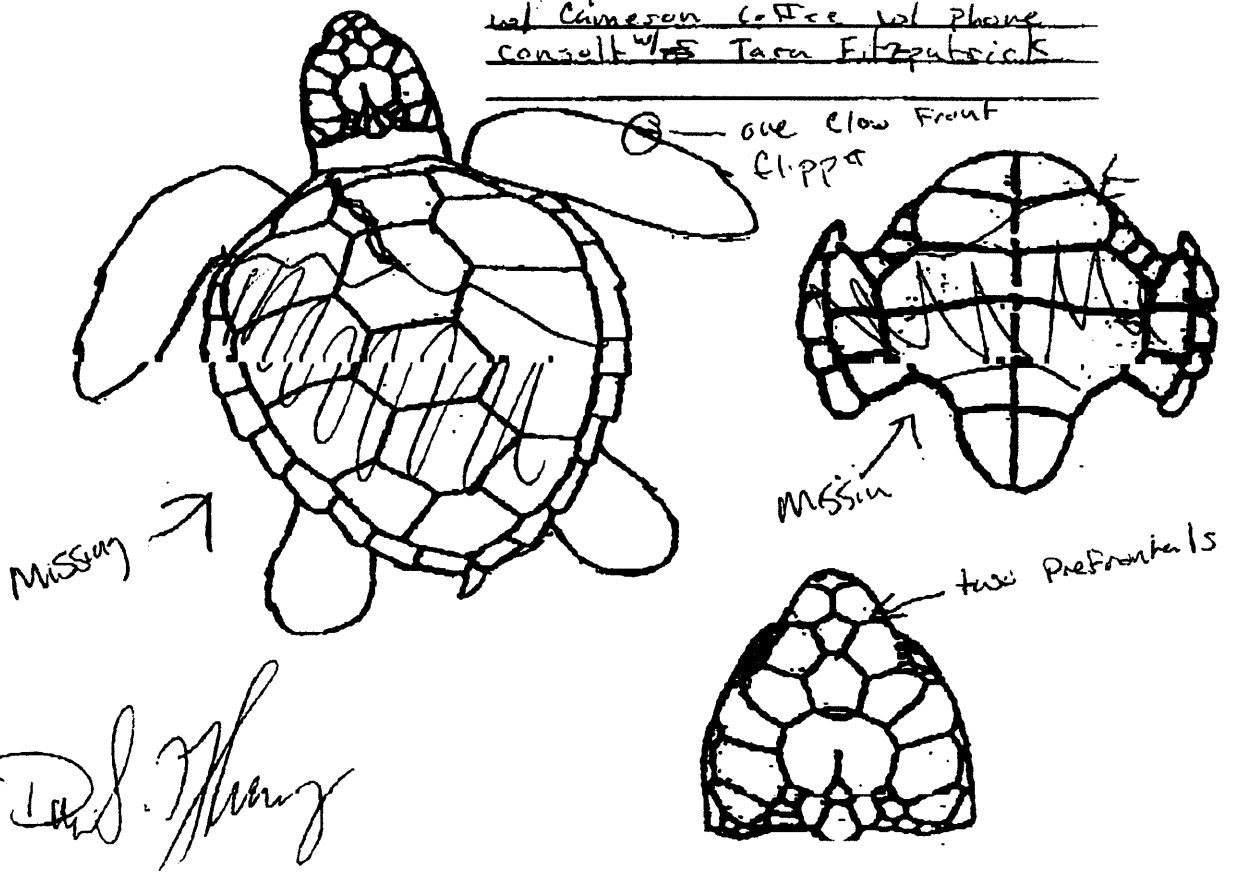
73

Blacken/shade parts which are missing.
Sketch any visible cracks and lacerations.

Comments: ID made on the basis of: two PreFrontal scales serrated jaw, presence of auricular groove, one claw on each Fron Flipper. Specimen torn up but fresh - no rigor muscular tissue pink + ~~Firm~~ firm no evidence of decay. No pyuria odor. recommended w/ Cameron Coffee w/ phone consult w/ Tara Fitzpatrick



Appendix 2
Discussion and Recommendation on the Impact of Sea Turtles Due to Hopper Dredge Activities on the Texas Coast

On December 15, 2002 a green sea turtle (*Chelonia mydas*) was incidentally taken by a hopper dredge project in Brazos Santiago Pass near Brownsville, Texas. The Army Corp of Engineers (ACOE) and National Marine Fisheries Service (NMFS) were immediately notified about the sea turtle incident. A few days after the incident, a meeting took place aboard the dredge *B.E. Lindholm* while it was temporarily shut down due to weather. The ACOE and two certified NMFS biologist discussed sea turtle behavior and migration patterns during the meeting to plan a more aggressive form of action during hopper dredge activity. On December 18, 2002 shortly after the ACOE meeting the dredge *B.E. Lindholm* resumed to dredging, this resulted in their second green sea turtle incident. The ACOE consulted with NMFS which resulted in the termination of the project, fearing that more turtles would be taken by the dredge. The yearly limit for the Galveston district is 5 green sea turtles. Since the project resulted in 2 of the 5 takes it was terminated so it would not impact further dredge projects in the site.

I had the opportunity to speak with Dr. Donna Shaver and Jeff George who both specialize in sea turtle behavior and migration patterns along the Texas coast. Their primary conclusion for dredging along the Texas coast is to start the projects as soon as possible. It is found that the ideal time to dredge is during the winter months due to low water temperature.

The South Texas coast presents some unique challenges because there is a year round sea turtle presence. The following is a written report put together for a more aggressive prevention plan in order to reduce further sea turtle incidents. First is the timing for water temperature; if above 55 degrees Fahrenheit, sea turtles are more likely present. Second, dealing with procedures of relocation trawling, taking into consideration weather, swell compensators, and the use of two trawlers. Last, examining historical sea turtle incidents on the Texas coast.

Timing dredging projects around water temperature is crucial. There is a species gradient along Texas coast waterways, where Kemp's ridleys dominate the northern Texas coast and green turtles dominate on the southern coast. Satellite tracking studies, sonic tracking studies, netting studies, and stranding work indicate that the Kemp's ridleys (the top of the endangered list) may move out of the upper Texas coast passes and bays as water temperature decreases. Green turtles (follow the ridleys on the endangered list) may also move out of the passes and bays when the temperature decreases. The population in the southern most areas of the state are more stable due to relatively warm water year round. Starting in mid-March the risk of turtle capture will increase, especially in south Texas where the temperatures remain warmer. Here is a list of some possible dredging areas off the coast of Texas:

- Sabine Pass - mostly Kemp's ridley turtles (with a few greens and a few loggerheads, possibly an occasional hawksbill). Captures of turtles were almost exclusively during the late-spring, summer, and early-fall.
- Galveston - species composition likely similar to Sabine Pass
- Houston - species composition likely similar to Sabine Pass
- Freeport - species composition likely similar to Sabine Pass

- Port Aransas - mixture of green turtles, Kemp's ridley, hawksbill, and loggerhead
- Corpus Christi - species composition similar to Port Aransas
- Port Mansfield - mostly green turtles (with a few hawksbills and loggerheads, possibly an occasional Kemp's ridley). January was the only month where no turtles were captured. April through December (peaking in September and October) is the period where sea turtles are most abundant. However, strandings in inshore areas of south Texas follow almost the opposite trend. The numbers are greatest during December, January, and February. Strandings are highly dominated by cold stunning, which validate that turtles can be present during these months in some years.

Another issue that needs to be addressed is relocation trawling procedures. Weather, swell compensators, and utilizing two trawlers are all key areas to look at to avoid shut down situations. Weather is the number one factor to cause sea turtle incidents by the dredge. The Army Corps of Engineers (ACOE) needs to formulate an outlined procedure for bad weather conditions. The swell compensators play an important role when harsh weather conditions set in. In the ACOE contract for dredging, there should be rules to follow when the swell compensators fail to keep the dragheads on the sea floor due to rough seas. For example, Dredge B.E. Lindholm of Weeks Marines has a swell compensator that allows dragheads to remain on the bottom is swells up to 8 feet. Dredging contracts should state that operations should be shut down temporarily until further notice of clear weather. If the swells rise above 8 feet, the dragtender will have trouble keeping the dragheads on the bottom. This may be one cause of turtle incidents by the dredge because the dragheads are now able to suck up anything in the water column. Another way to prevent turtle incidents is to trawl 6 hours prior to dredging after bad weather has struck. The trawler can cover all the surface area of the dig site (same as pre-trawling) before the dredging operation begins, this will clear the area of all turtles. Utilizing 2 trawlers are very effective and ACOE and the dredge company should consider this for future projects. In areas where there is an abundance of turtles, especially Texas, using two trawlers would be the best solution while dredging in order to cover as much bottom as possible.

Another suggestion that would be an excellent guide for future projects would be to examine the historical sea turtle incidents with hopper dredges. Once that information is analyzed, a better conclusion to where and when dredging projects can start with the least chance for incidents can be made. These are some views and ideas that our MESO office has come up with. We strongly recommend that the ACOE takes this report in consideration to prevent sea turtle incidents with hopper dredge activity. We know that dredging entrance channels is imperative, if all ends meet with everyone working together, the outcome will be rewarding.